Arkansas River Parker Through Truss
Structure #57E0441N3590006
Northeast of Blackburn
Pawnee and Osage Counties
Oklahoma

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Oklahoma State Historic Preservation Office
Oklahoma Historical Society
Oklahoma History Center, 800 Nazih Zuhdi Dr.
Oklahoma City, Oklahoma 73105

DOCUMENTATION
BRIDGE #57E0441N3590006

I. INTRODUCTION

Location:	Spans the Arkansas River on section line road EW-44.1 on the northeast edge of Blackburn. (Township 22N, Range 7E, Sections 18 and 19). UTM: Zone 14, 4028375N, 715877E
Map Reference:	USGS 7.5' series, *BUG CREEK, OKLA.* (1978)
Date of Construction:	1932
Present Owner:	Osage County Commissioners Osage County Courthouse Pawhuska, Oklahoma
Present Use:	One-lane vehicular bridge being replaced by a new two-lane structure.
Significance:	The Arkansas River Parker Through Truss illustrates the importance of bridges to adjacent towns that depended upon the commerce that they brought. It is also a good example of the work of an Oklahoma bridge-building company, the J. B. Klein Iron and Foundry Company of Oklahoma City.
Preparer:	Anna Marie Eddings, Historian/ Architectural Historian, Oklahoma Department of Transportation Cultural Resources Program, March 29, 2013

II. HISTORICAL SUMMARY

The Arkansas River Parker Through Truss northeast of the town of Blackburn is located where the Arkansas River once formed the boundary between the Osage Indian Reservation on the northeast and the Pawnee Indian Reservation on the southwest. After the Pawnees accepted allotment, their reservation became part of Oklahoma Territory and was open to homesteaders in the Cherokee Outlet Opening on 16 September 1893. John R. Skinner, a trader on the Osage reservation, participated in this opening when he brought his merchandise across the Arkansas River at a natural ford and opened a store in the Cherokee Outlet near this crossing. Skinner anticipated that the site would be on the path of railroad construction from Saint Louis to Guthrie. Although area residents at first referred to it as Skinnerstown, the name Blackburn was chosen to honor Senator Joseph C. S. Blackburn of Kentucky. A post office opened here on 15 December 1893.[1]

Before Oklahoma statehood, the prohibition of alcohol in the Indian nations led to what became known as "whiskey towns" along their borders in Oklahoma Territory, where alcohol was legal. These towns had a disproportionate number of saloons and whiskey peddlers to attract the nearby inhabitants of Indian Territory. Some whiskey towns would not have existed without the patronage that alcohol brought, and all relied upon it for much of their business. Blackburn, Cleveland, Ralston, and Keystone were all whiskey towns on the Arkansas River that drew in customers from the Osage reservation. Blackburn had famous saloons operated by Abe Leonard and Karl Barlinger, as well as the Blackburn Saloon which was one of the town's most thriving businesses. Reportedly, there was also a designated meeting place near the Arkansas River ford where bootleggers met their clients from across the river to dispense whiskey.[2]

Bridges or ferries across the Arkansas River naturally aided this trade in the Pawnee County whiskey towns. John R. Skinner was instrumental in building a wagon bridge supported by timber pile bent piers across the Arkansas River at Blackburn in 1895. However, Osage agent H. B. Freeman was so proactive in his efforts to protect the Osages from the dangers of alcohol use that he opposed the bridge's construction and attempted to destroy it in various ways, including blocking it on the Osage Reservation side and contending that the Arkansas River was a navigable stream. Although Freeman's efforts ultimately failed, damage or complete destruction from floods was common for these early Arkansas River bridges and it is unclear how long this bridge at Blackburn lasted, although sources confirm that a bridge was still present in 1902 and in 1908. Ferries were often used when a bridge was not in service.[3]

Due to the efforts of Blackburn's leaders such as Skinner, the town initially became a busy agricultural trade center. Its location on the Arkansas River put it near rich river bottom land. Corn and cotton were the major crops of the area, although there were a number of fruit growers

as well. One of these fruit growers, John Scheihing, Sr., along with others founded the Blackburn State Bank to finance agricultural expansion. In 1897, A. F. Meyers operated a cotton gin, saw mill, and grist mill to serve farmers in the vicinity. He also became vice president of the German-American Bank when it was established around 1901. The town had a variety of business establishments in 1895 including John R. Skinner and R. T. Gentry's general merchandise, Robert Ward's blacksmith and wagon shop, William Kelly's Pioneer Hardware, S. Toles's livery stable, Charles Meyers's lumber yard and saw mill, and W. T. Custer's grocery store. Although a 1901 drought caused many to abandon their farms, agriculture made such a recovery that the town hosted the county fair annually from 1903 until 1909. The Lowe Well No. 1 struck oil near Blackburn in 1905, but a more productive oil field developed across the river on the Osage Reservation. Enough of this oil field's workers took up residence in Blackburn to give it an economic boost.[4]

Blackburn, however, failed to continue the growth that its leaders had reckoned on. John R. Skinner, who founded the town and built the Arkansas River bridge expecting to attract a railroad line, was a typical speculative businessman. Like other frontier entrepreneurs, he did not simply accept conditions as he found them--instead, he took action to improve the economic conditions of his area. Nevertheless, to continue their growth, towns in these newly-settled territories of the late nineteenth and early twentieth centuries generally needed railroads to connect them to outside markets, which would attract business capital and population. Scholars have characterized towns built in anticipation of a railroad like Blackburn as inland towns, which developed from the small trading posts of the frontier era and led to the railroad towns that eventually eclipsed them. Despite the incentives offered by Blackburn developers, railroads bypassed the town. The Eastern Oklahoma Railway Company's track crossed the Arkansas River at Ralston to the northwest between 1900 and 1904, while the Missouri, Kansas and Oklahoma Railroad Company's track crossed the Arkansas River to the southeast near the town of Cleveland between 1903 and 1904. Still, rumors of a railroad coming to Blackburn continued for years after this. The oil field activity helped sustain Blackburn for a while, but when production declined the town diminished further. It had 330 residents in 1907 and 335 residents in 1910. Thereafter, the population shrunk to 257 in 1920 and 198 in 1940.[5]

The lack of an Arkansas River bridge for a number of years may have also been a factor in Blackburn's general diminution. As described above, these early bridges were often damaged or completely washed away by flooding. Although sources consulted were unclear on exactly when the town was left without a bridge, a flood on the Arkansas River in 1923 destroyed several bridges in the vicinity. In the absence of a bridge at Blackburn in the 1920s and early 1930s, Jack Kenney operated a ferry guided by cable and constructed of salvaged boards from an oil well site. It was located east of the present bridge. Presumably to replace bridges demolished by the 1923 flood, in 1924 Pawnee County passed a bond issue to build Arkansas

River bridges at Cleveland, Belford, and Blackburn.[6]

However, it was a relatively long time before the bridge at Blackburn was in fact constructed. The bond issue may not have generated sufficient funds, because only the piers for the Blackburn bridge were built by the late 1920s. Pressed upon by a delegation from Blackburn, the Pawnee County commissioners decided in their meeting on 3 February 1932 to have the County Engineer Oscar F. Sewell prepare plans for putting steel trusses on the piers, and to pay for them by combining approximately $23,000 left from the 1924 bond issue with a levy producing $7,500 in the 1931-32 county road budget. They hoped to convince the Osage County commissioners to pay for a floor and approaches for the bridge, even though previous negotiations with the Osage commissioners had been inconclusive. At the Pawnee County commissioners' meeting on 5 April 1932, County Engineer Sewell submitted the cost for the six steel trusses for the Blackburn bridge as $35,100, and the commissioners resolved to advertise for bids. They opened the bids at their meeting on 26 April 1932, and the lowest bid of $33,855.90 was from the J. B. Klein Iron & Foundry Company of Oklahoma City. Nevertheless, the commissioners did not award the contract. A reported reason was a shortage of money in the county bridge fund, but the commissioners were asking the excise board to allow a transfer of money from the county highway fund to the bridge fund. In addition to the possibility of this transfer, another factor that may have enabled the eventual awarding of the contract was the reported offer by the Osage County commissioner in the district across the river from the bridge for the Osage commissioners to set aside $10,000 in their next budget to complete the bridge with a wood deck. Finally, in their meeting on 16 May 1932, the Pawnee County commissioners awarded the contract to the J. B. Klein Company for $33,852. Later in 1932, county newspaper reports noted progress on putting up the steel trusses, although they also reflected continued uncertainty about whether the bridge could be completed, which leaves room to doubt the reliability of the financing plans for the bridge deck.[7]

The Arkansas River Parker Through Truss's halting construction history helps explain why it has some characteristics of bridges built in the previous decade. In its riveted connections and its use of rolled I-beams instead of built-up beams for most verticals and diagonals, it is similar to bridges built for highway traffic in the 1930s. However, its eighteen-foot-wide deck was typical for bridges built in the late 1920s, in contrast to the twenty-two feet standard in 1931. This narrow width probably reflects the fact that the bridge was planned as early as 1924, and its piers were already built by the late 1920s. The bridge did eventually get a wood deck, although by the early 1930s concrete decks were the standard. This appears to have been for reasons of economy because, as the bridge's construction record shows, finding the funds for it was difficult for Pawnee County. The wood deck also partly accounts for the bridge's relatively lightweight appearance, because the trusses did not need to be as strong as they would if they had a heavier concrete deck to support. Because the bridge was not on a state or US highway, and it was

apparently built without state or federal aid, there was no requirement for it to conform to current state construction standards. Its construction entirely by the J. B. Klein Iron and Foundry Company is also characteristic of an earlier time because, in contrast to the older bridge companies which focused on bridges and handled all facets of their construction, companies in the 1920s and later including Klein manufactured a variety of metal products and for the most part only fabricated bridges and sold them to a general contractor to erect, particularly when the bridge was part of a larger road construction project.[8]

The J. B. Klein Iron and Foundry Company began in 1909 as the J. B. Klein Iron and Wire Works, and was established in Oklahoma City by brothers John Bernard and William Klein. At first, they specialized in foundry work including ornamental iron and wire, and later they expanded into structural steel. By 1917, the Kleins had bought the Central Foundry Company and moved to its location. In the 1920s, the company was expanding by increasing foundry and structural steel capacity, which included purchasing new machinery such as a fifteen-ton, electrically-operated traveling crane. Their first structural steel contract was for the Convention Hall in Galveston, Texas. With this expansion, they also began to fabricate steel bridges and reinforcing bars for concrete pavement. By 1927, the company had 235 employees, a complex of six buildings, and yardage space spread over two blocks. It did business throughout Oklahoma, north Texas, and the Texas panhandle, with occasional contracts in Arkansas, Kansas, Colorado, and New Mexico. When J. B. Klein died in 1925, general manager Richard W. Robberson carried on the leadership and later bought the company, changing its name to Robberson Steel and Bridge Company in 1942. The company continued structural steel fabrication until it went bankrupt and closed in December of 1988.[9]

The design of the Arkansas River Parker Through Truss, besides reflecting on its construction history and the J. B. Klein Iron and Foundry Company, also reflects the evolution of metal truss bridge technology. This design was named for Charles H. Parker, whose 1870 patent for improved connections on a curved-top-chord-truss was so widely used that the profile became synonymous with him. Below this curved top chord, a Parker truss has vertical beams that carry compressive forces and diagonal beams that carry tensile forces. This curved design is an efficient use of metal because it allows for more height at the center of the truss where forces are strongest, and less height at the ends of the truss where the forces are weaker and the extra metal is not needed. Conversely, in a Pratt truss which has a flat top chord, the maximum height necessary at the center is continued throughout the truss, which would make a Pratt truss heavier than a Parker truss of the same length. Therefore, Parker trusses were used instead for these longer spans. The Arkansas River Parker Through Truss also illustrates the transition from a Parker truss to a K-truss. There are horizontal struts in the center two panels of each span which do not carry loads but instead stiffen the adjacent verticals, where stresses are highest. The modified Parker design used in other bridges adds half-panel diagonal stiffening members, while

in the K-truss, load-bearing diagonals in a "K" pattern replace stiffening struts entirely.[10]

III. DESCRIPTION

The Arkansas River Parker Through Truss has six, 160-foot Parker through truss spans and four steel I-beam approach spans (two at each end of the bridge). It has a total length of 1,136 feet, and its deck is eighteen feet wide. It has riveted connections.

An explanation of some truss bridge terminology helps to describe this bridge. A truss's top and bottom beams are called the top and bottom chords, and stretching between these chords are vertical and diagonal beams. However, the diagonal beam that connects the top and bottom chords at the end of a truss is called the inclined end post. A description of each of these beams in the Arkansas River Parker Through Truss follows:

Top chord: Pair of C-beams connected with plate on top and zig-zag lacing on bottom
Inclined end posts: Same as the top chord
Bottom chord: Pair of C-beams connected with stay plates
Verticals: I-beams
Diagonals: I-beams, except for the diagonals in the center two panels, which are two L-beams connected with stay plates
Horizontal struts: Pair of C-beams connected with stay plates

The composition of a truss bridge's beams is noteworthy because it helps to depict how they function. As described above, defining features of a Parker truss are verticals that are in compression and diagonals that are in tension. This is easy to see in pin-connected bridges because the diagonals and other tension beams are thin eye-bars that cannot withstand compressive forces. However, riveted connections, such as the Arkansas River Parker Through Truss has, are more rigid than pinned connections and do not allow for the free transfer of forces between beams, which means the diagonals are also subject to compressive forces as live loads move across the truss. Therefore, in bridges with riveted connections, the diagonal beams will be strong enough to withstand some compressive force, and may be identical to the vertical beams, as is the case with this bridge.[11]

A "panel" is a unit referring to the area between any two verticals, as well as the area between the end vertical and the inclined end post at the end of the truss. This bridge's trusses are each eight panels long. As noted above, there are horizontal struts in the center two panels of each truss to stiffen the adjacent verticals where stresses are highest.

A "through truss" is a truss bridge that has struts and lateral bracing over the top of the

roadway. This bridge has L-beam struts with top lateral bracing in an X pattern between them. Beneath these struts, the sway bracing is in a double X pattern. Portal bracing is a row of four X's, and underneath it there are curved portal brackets. These bracing beams, like the struts, are all L-beams.

Although, as noted above, this bridge originally had a wood deck, it has been replaced by a metal deck surfaced in asphalt. Beneath this deck are I-beams running longitudinally the length of the trusses, and larger I-beam floor beams spanning the width of the trusses. Between the floor beams, bottom lateral bracing consists of L-beams in an X pattern.

The bridge's southwest abutment is metal, while the northeast abutment is timber. A bridge's wing walls are designed to extend out from the front wall of the abutment to retain roadway fill. The southwest wing walls are metal and extend back from the abutment, forming an acute angle with the road. The northeast wing walls are timber and extend straight out from the abutment, forming a ninety-degree angle with the road. The pier between the two southwest approach spans is a metal pile bent, while the pier between the two northeast approach spans is a timber pile bent. Because of this difference in material, as well as a difference in design of the approach span I-beams, the southwest abutment, wing walls, approach spans, and the pier between the approach spans all appear to be non-original. The concrete piers which support the trusses are columns with solid web wall in between. The trusses rest on plate bearings on top of the piers.

The Arkansas River Parker Through Truss carries a county road in a rural setting, just outside of the small town of Blackburn. Under a Memorandum of Agreement with the Oklahoma State Historic Preservation Office, it is being replaced by a modern two-lane bridge on an offset alignment. Although the bridge has a non-original deck and a non-original southwest approach, it retains overall historic integrity because the trusses themselves remain unaltered. They are in good condition, with no significantly bent or damaged beams. The concrete piers have some cracking, efflorescence, and spalling.

IV. ENDNOTES

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(Oklahoma City, OK: Published for the Oklahoma Heritage Association by Western Heritage Books, 1994), 146; Indian-Pioneer Papers Collection, vol. 110, p. 320, Western History Collections, University of Oklahoma, Norman, Oklahoma.

2. Blake Gumprecht, "A Saloon on Every Corner: Whiskey Towns of Oklahoma Territory, 1889-1907," *Chronicles of Oklahoma* 74 (Summer 1996), 146-47, 160-61, 169; Franks and Lambert, *Pawnee Pride*, 147.

3. "Blackburn," *Oklahoma Review*, in "Blackburn" vertical file, Research Division, Oklahoma Historical Society; Indian-Pioneer Papers Collection, vol. 91, p. 227, v. 20, p. 328, vol. 110, p. 320, Western History Collections, University of Oklahoma; Hager, "Blackburn, Oklahoma Town," 423-27; Gumprecht, "Saloon on Every Corner," 161; General Land Office (GLO) Map for Township 22 North, Range 7 East, 1909; Franks and Lambert, *Pawnee Pride*, 223.

4. Franks and Lambert, *Pawnee Pride*, 147-49; Linda D. Wilson, "Blackburn," *Encyclopedia of Oklahoma History and Culture*, http://digital.library.okstate.edu/encyclopedia (accessed 18 November 2011); "Blackburn," *Oklahoma Review*, in "Blackburn" vertical file, Research Division, Oklahoma Historical Society; Hager, "Blackburn, Oklahoma Town," 421, 428.

5. John C. Hudson, *Plains Country Towns* (Minneapolis, MN: University of Minnesota Press, 1985), 12-13; George O. Carney and Brad A. Bays, "Reconnaissance Level Survey of Four Western Oklahoma Towns" (report submitted by the Department of Geography, Oklahoma State University, to the Oklahoma State Historic Preservation Office, Oklahoma Historical Society, 1997), 205, 212; Chester M. Davis, *Railroads of Oklahoma* (N.p.: State of Oklahoma Department of Transportation Survey Division, 1978), 38, 53, 79; Wilson, "Blackburn," *Encyclopedia of Oklahoma History and Culture*; Hager, "Blackburn, Oklahoma Town," 427; Franks and Lambert, *Pawnee Pride*, 149.

6. Indian-Pioneer Papers Collection, vol. 20, p. 328, vol. 110, pp. 320, 323, Western History Collections, University of Oklahoma; William J. Carter, "Blackburn: An Oklahoma River Town," in "Blackburn" vertical file, Pawnee County Historical Society Museum, Pawnee, Oklahoma; *Cleveland American*, 4 February 1932; Franks and Lambert, *Pawnee Pride*, 147.

7. *Cleveland American*, 4 February, 28 April, 5 May 1932; Pawnee County Commissioners, *Commissioners' Journal*, vol. 7, p. 606, 7 July 1931, vol. 8, p. 61, 3 February 1932, p. 75, 5 April 1932, p. 77, 26 April 1932, p. 83, 16 May 1932, County Clerk's Office, Pawnee County Courthouse, Pawnee, Oklahoma; Carter, "Blackburn," in "Blackburn" vertical

file, Pawnee County Historical Society Museum; *Pawnee Courier-Dispatch*, 18 August, 3 November 1932.

8. Wes Kinsler, "Blackburn Bridge Across the Arkansas River," http://okbridges.wkinsler.com/arkansasbridge6.html (accessed 27 October 2011); *Report of the State Highway Commission, 1927-28* (Oklahoma City, Oklahoma, January 1, 1928), 36; *Report of the State Highway Commission, 1929-30* (Oklahoma City, Oklahoma, December 31, 1930), 57; *Report of the State Highway Commission, 1931-32* (Oklahoma City, Oklahoma, December 31, 1932), 47; Joseph E. King, *Spans of Time: Oklahoma Historic Highway Bridges* (Oklahoma City, OK: Oklahoma Department of Transportation Planning Division, 1993), 51.

9. Bobby Weaver, "Klein Iron and Foundry Company," *Encyclopedia of Oklahoma History and Culture*, http://digital.library.okstate.edu/encyclopedia (accessed 14 February 2011); Leon E. Maxey, "Building an Oklahoma Steel Company," *Harlow's Weekly* 26 (17 September 1927), 4-6.

10. Lola Bennett, "Frog Bayou Bridge (Clear Creek Bridge), Mountainburg vicinity, Arkansas" (Historic American Engineering Record, National Park Service: 2007), p. 5, accessed at http://memory.loc.gov/ammem/collections/habs_haer/index.html ; FRASERdesign, *Missouri Historic Bridge Inventory: Draft Inventory Report*, vol. 1 (n. p.: Missouri Highway and Transportation Department, April 1996), 102; James L. Cooper, *Iron Monuments to Distant Posterity: Indiana's Metal Bridges,1870-1930* (n.p.: DePauw University, Federal Highway Administration, Indiana Department of Highways, Indiana Department of Natural Resources, National Park Service, 1987), 70; Wes Kinsler, "Truss Bridges in Oklahoma: Oklahoma's State-Standard Designs," http://okbridges.wkinsler.com/builders/oklahoma.html (accessed 27 October 2011).

11. Wes Kinsler, e-mail to Anna M. Eddings, 10 October 2008, copy in the hands of Anna M. Eddings, Norman, Oklahoma.

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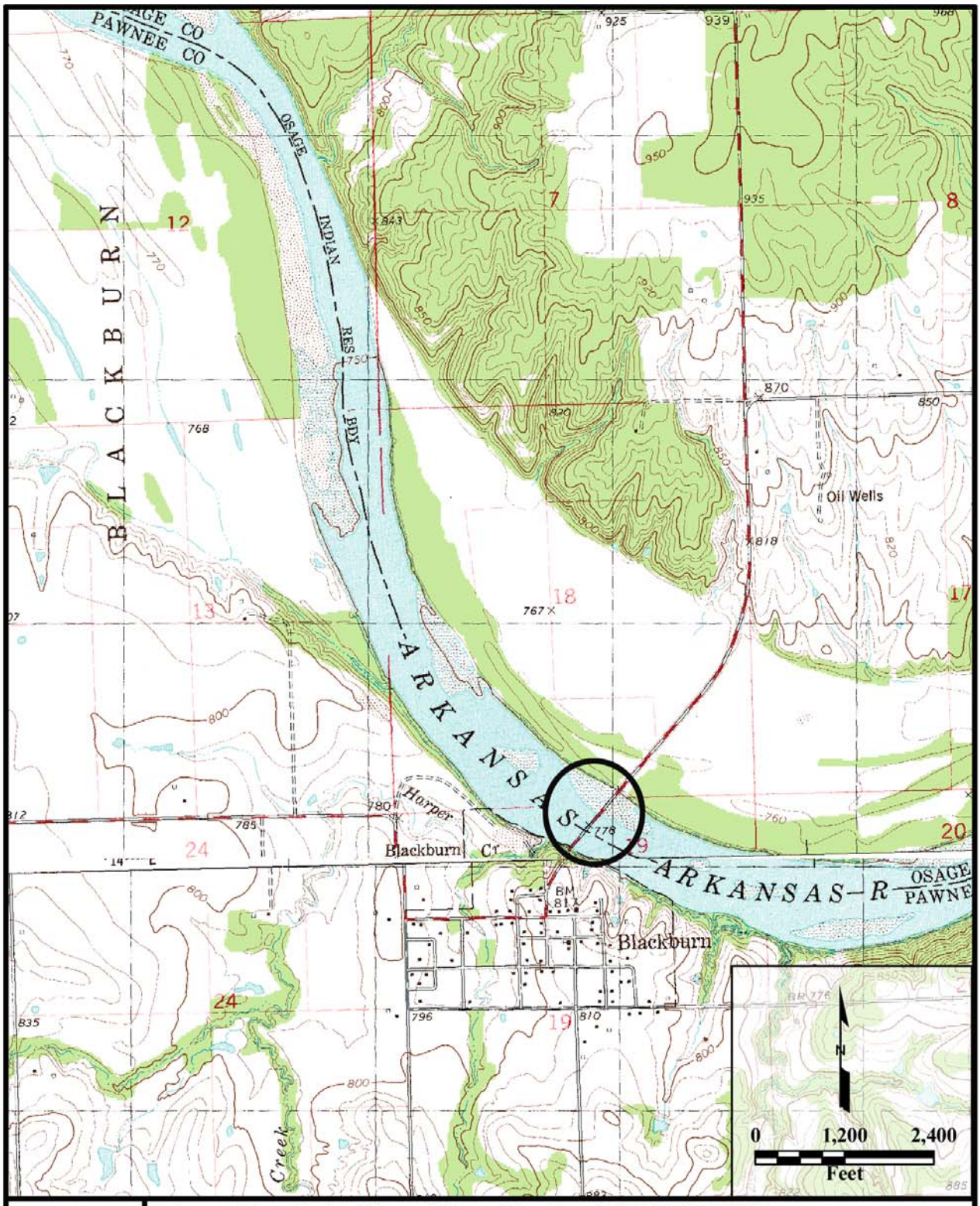

Arkansas River Parker Through Truss, Structure #57E0441N3590006
Sections 18 and 19, T22N, R7E
Pawnee and Osage Counties
Oklahoma

Source: USGS Bug Creek and Blackburn Quadrangles

Arkansas River Parker Through Truss
Structure #57E0441N3590006
Northeast of Blackburn
Pawnee and Osage Counties
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LIST OF PHOTOGRAPHS

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15 FT. 1 IN.